Intelligent Synthesis Environment Initiative

COST AND RISK MANAGEMENT TECHNOLOGY ELEMENT

ISE Government Agency Workshop

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Cost and Risk Management Technology

Vision

Enhance the decision-making process by the infusion of relevant and timely cost, economic, schedule and risk information throughout the system life cycle.

Goals

- Provide NASA with life cycle cost and risk management models, tools, and methodologies
- Provide validated tools for life cycle simulations early and throughout the life cycle
- Establish basis for trades between performance, cost, schedule and risk parameters

Challenges

- Cost and risk capability across all mission types and over the full life cycle
- Databases and data collection practices
- Reliable, credible, validated, rapid tools and models
- Integration of cost and risk into the trade space

Approach

- Build from existing capability
- Use large-scale testbeds to determine requirements and priorities
- Generate Technology Roadmaps
- Develop integratable advanced cost and risk management tools for life cycle simulations

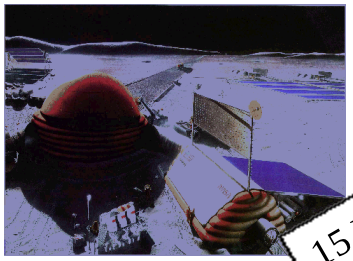
WBS

- Cost, Schedule and Risk Synthesis
- Advanced Risk Management Tools
- Advanced Cost Tools

Cost and Risk Management Technology

Now

5 Yrs

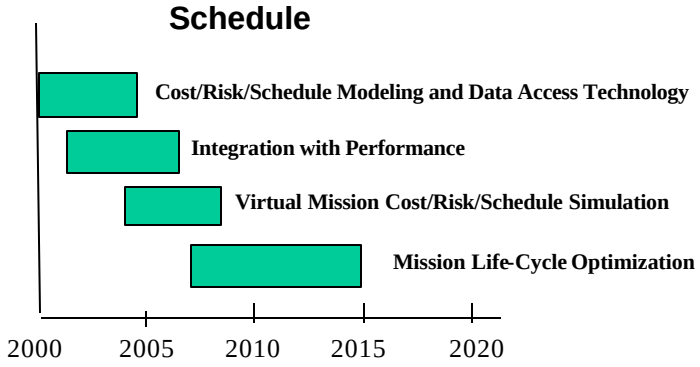


15 Yrs

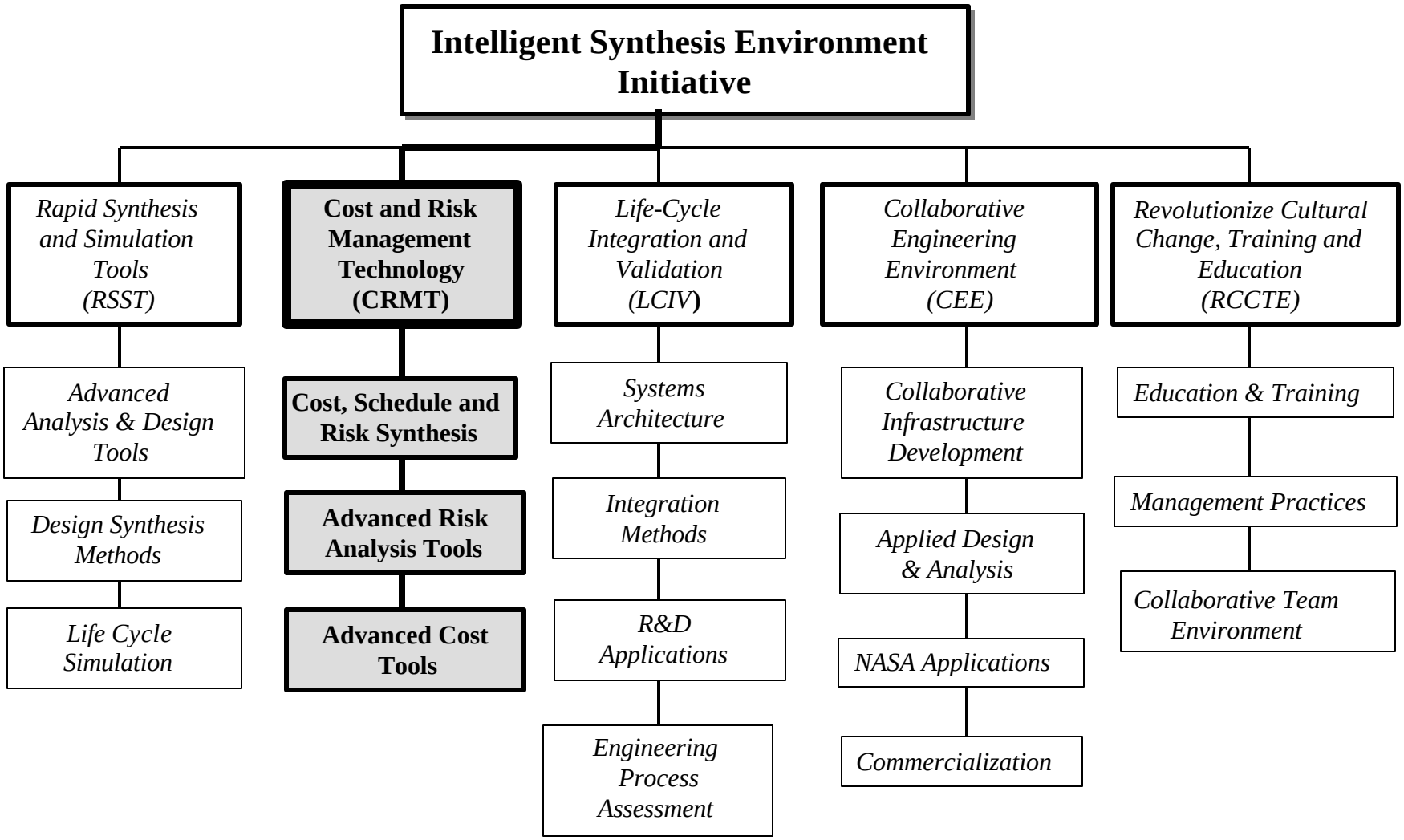
	Now	5 Yrs	15 Yrs
Focus:	**Improved Life-Cycle Cost, Risk, and Schedule Models**	**Reliable Cost, Risk, Schedules Integrated in Life-Cycle Simulations**	**Life-Cycle Optimization Trading Performance, Costs, Risks, & Schedule**
Metrics			
Credibility	• Early Design	• Design/Development	• Mission-in-the-Computer
Speed	• Days-Weeks	• Minutes-Hours	• Milliseconds-Seconds
Fidelity	• System Elements	• Process Details	• Virtual Development
Integration	• Enterprise Specific	• All Enterprises	• All Missions

Objectives/Impacts:

- Validated reliable, high-fidelity tools for mission life-cycle cost, risk, and schedule prediction
- Integration of cost, risk, and schedule with mission performance in the design trade process
- Track cost, risk and schedule parameters throughout the life cycle
- **Impact: Enable early mission and technology investment decisions to reduce wasted/discarded effort to negligible level**



WORK BREAKDOWN STRUCTURE



CRMT TEAM STRUCTURE

Intelligent Synthesis Environment Initiative

Cost and Risk Management Technology (CRMT)

Lead: Arlene Moore, LaRC
Deputy: Kelley Cyr, JSC

CRMT Management Team

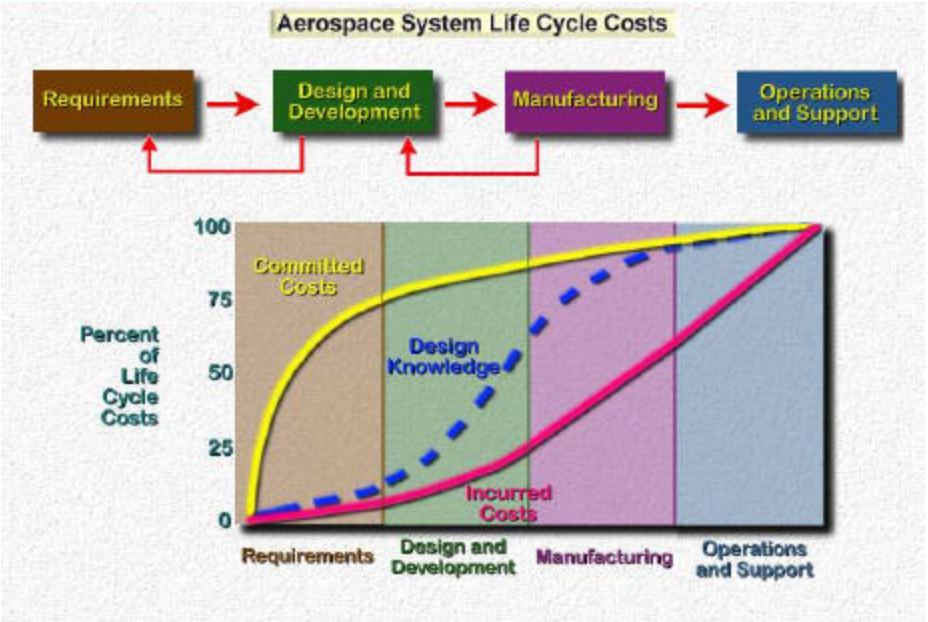
Lead: Arlene Moore
Deputy: Kelley Cyr
NASA Center Representatives from KSC, GRC, GSFC, JPL, MSFC, SSC

CRMT Technical Working Group

Lead: Kelley Cyr
Representatives from NASA, Other Government Agencies, Industry and Academia

Background

- Better cost methods cited as a critical science and engineering challenge:
  - Lack of accurate costing methods
  - Long model development and simulation time



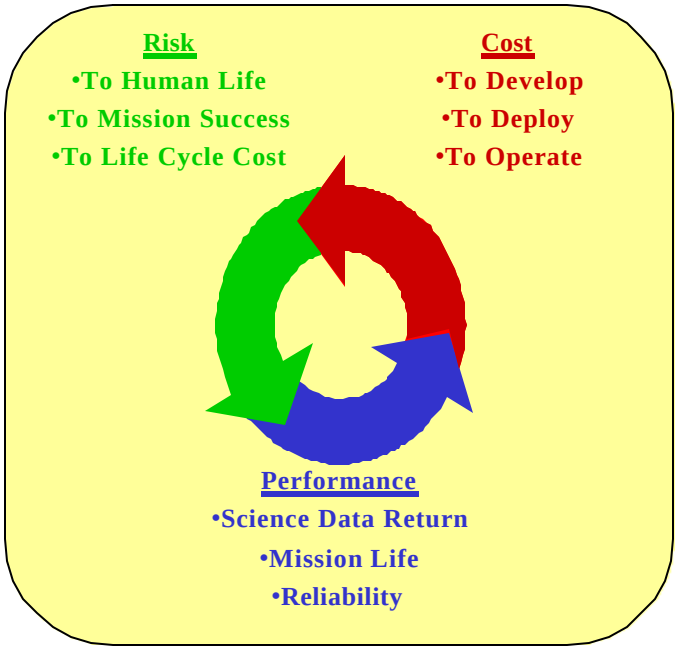
- NASA policy
  - Stresses risk management as an integral part of project management
  - Requires that a risk management plan be developed before program approval

- Changing environment:
  - Shift in budgetary environment
  - “Better, Faster, Cheaper” - NASA has undergone a radical change in the way it conducts missions
  - “Pathways to the Future” -- Future missions will take revolutionary leaps

Integrated Approach

- Provide **validated** advanced cost and risk analysis methods and tools for:
  - **Integration** into the **design environment** for early and often feedback into **life-cycle** analysis
  - **Computational simulations**
    - Utilize **advanced methods**, such as genetic algorithms, fuzzy logic, et. al.
    - Simulate the processes
    - Link time parameter (I.e., product/mission schedule) directly with cost and risk
  - Produce **near-real time** information for **practicing** scientists and engineers and managers

NASA's Mission Life Cycle Analysis



CRMT SUMMARY

- Need for improved capability in cost and risk analysis is universal and widely recognized

- The challenges presented by this need are shared by Government organizations and industry

- Revolutionary change will happen through partnerships and collaborations